T///-15 03				
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	 	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 Frequency of Riffles	Occurrence of riffles relatively frequent; spacing between riffles 5 to 7 stream widths. Variety of habitat is key. In streams where riffles are continuous, boulders or logs are important	Occurrence of riffles infrequent; distance between riffles divided by stream width is between 7 to 15.	Occasional riffle or bend: bottom contours provide some habitat; distance between riffles divided by stream width is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width is > than 25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE	Left Bank 10 9	8 7 6	5 4 3	2 1 0
(LB)				
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE	Left Bank 10 9	8 7 6	5 4 3	2 1 0
(LB) SCORE	Dight Pouls 10 C			
(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

STREAM NAME: IN	T-12 DS		LOC	ATION:	Ass#8	
STATION:	DRAINAGE .	AREA (AC)	BAS	IN/WATERSHEI	D Big Sandy Riv	ver
LAT: 38-05-43.7	LONG:	82-38-22.7	cou	NTY; La	wrence USGS 7.5 TC	
	TIME:	22 AM 🗀	PM INVI	ESTIGATORS;	Rob Lewis, Rick	Heil
DATE: 2-11-09 TYPE SAMPLE: □ P-CHI			FISH B		Noo Bewis, Men I	
WEATHER: Nov		4 hours			ain in the last 7 days?	
	☐ He	avy rain	☑Yes	□No	•	
<u> </u>	🗹 Inte	ady rain ermittent showers ear/sunny	Air tempe	rature 55 Cloud Cover	°F. Inches rain	nfall in past 24 hours in
P-Chem: Temp (°F)	43.2 D.O. (% Saturation	pH(S	S.U.) Cond.µ	us
INSTREAM WATERSHE	D					
FEATURES	-	OCAL WATERS				
Stream Width EOW 2		edominant Surrou	-		5 Famou	•
Stream Width BF 4	ft □		g	☐ Construction ☐ Commercia		t re/Grazing
Range of Depth Bankfull Depth 0.1-1	1.0 ft			☐ Industrial		ulture
Bankfull Depth 0.5 Est. Reach Length	—— # 🗀			☐ Row Crops		Runoff/Storm Sewers
Est. Reach Length		•		_ Row Crops		
Hydraulic Structures:			ream Flow;			ream Type;
□ Dams □	Bridge Abutmer					
☐ Island ☐	Waterfalls	⊠ Hig	gh 🗖 Very	Rapid or Torrent	tial 🗖	I Ephemeral □ Seep
☐ Other ☑	Culverts					
Riparian Vegetation:		Dom. Tree/Shru	ь Таха	Canopy Cover		Channel Alterations; Dredging
Dominate Type:	Chm.L.	Walnut			oosed (0-25%) Exposed (25-50%)	☐ Dredging ☐ Channelization
☑ Trees □ Grasses □	Shrubs Herbaceous	Wainut Oak			Shaded (50-75%)	(D Full Partial)
Number of Strata		Sycamore			ided (75-100%)	(
		-,····			,	
		F				
	P.C	Riffle 4		Run;	%	Pool <u>60</u> %
Silt/Clay (<0.06 mm)		20				20
Sand (0.06-2 mm)		31		 		50 30
Gravel (2-64 mm)		4.		-		30
Cobble (64-256 mm) Boulders (>256 mm)		,				
Bedrock				1		
Habitat				Condition Ca	itegory	
Parameter		imal		optimal	Marginal	Poor
	Greater than 70%	% of substrate	1	of stable habitat;	20-40% mix of stable ha	
1. Epifaunal	favorable for epi		well suited for		habitat availability less t desirable; substrate	than habitat" lack of habitat is obvious; substrate unstable
Substrate/ Available	colonization and of snags, subme		colonization padequate habi		frequently disturbed or	or lacking.
Cover	undercut banks,			of populations;	removed.	01 140 MM
	stable habitat an	d at stage to	presence of ac	lditional		
	allow full coloni	zation potential		e form of new		
	(i.e., logs/snags	that are <u>not</u> new		et prepared for		
	fall and <u>not</u> trans	sient.	end of scale).	may rate at high		
SCORE	20 19	18 17 16		13 12 11	10 9 8 7	6 5 4 3 2 1 0
SCORE	Gravel, cobble,			e, and boulder	Gravel, cobble, and bou	
2. Embeddedness	particles are 0-2	5% surrounded	particles are 2	5-50%	particles are 50-75%	boulder particles are more
	by fine sediment	. Layering of	surrounded by	fine sediment.	surrounded by fine sedir	
	cobble provides	diversity of				fine sediment.
COOPE	niche space.	10 15 17	15 14	12 12 11	10 8 7	6 5 4 3 2 1 0
SCORE		18 17 16	15 14	13 12 11		
2 Valority/Danth Basins	All four velocity present (slow-de		Only 3 of the present (if fas		Only 2 of the 4 habitat regimes present (if fast-	Dominated by 1 velocity/depth regime.
3. Velocity/Depth Regime	shallow, fast-de			e lower than if	shallow or slow shallow	are
	Deep > 1.5 feet.		missing other	regimes)	missing score low)	
SCORE		18 17 16	15 14	13 12 11	10 9 8 7	6 5 4 3 2 1 0

4. Sediment	Little or no enlargement of	Some new increase in bar	Moderate deposition of new	Heavy deposits of fine
Deposition	islands or point bars and less	formation, mostly from	gravel, sand or fine sediment	material, increased bar
	than 5% of the bottom affected	gravel, sand or fine sediment;	on old and new bars; 30-50%	development; more than 50%
	by sediment deposition.	5-30% of the bottom	of the bottom affected;	of the bottom changing
	•	affected; slight deposition in	sediment deposits at	frequently; pools almost
		pools.	obstructions, constrictions,	absent due to substantial
			and bends; moderate	sediment deposition.
			deposition of prois, revalent.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both	Water fills > 75% of the	Water fills 25-75% of the	Very little water in channel
	lower banks, and minimal	available channel; or <25%	available channel, and/or	and mostly present as
	amount of channel substrate is	of channel substrate is	riffle substrates are mostly	standing pools.
	exposed.	exposed.	exposed.	5 4 3 2 1 0
SCORE	20 19 18 17 16	15 14 13 12 11		Banks shored with gabion of
6. Channel Alteration	Channelization or dredging	Some channelization present,	Channelization may be extensive: embankments or	cement; over 80% of the
	absent or minimal; stream with	usually in areas of bridge	shoring structures present on	stream reach channelized and
	normal pattern.	abutments; evidence of past channelization, i.e., dredging,	both banks; and 40-80% of	disrupted. Instream habitat
		(greater than past 20 yr.) may	stream reach channelized and	greatly altered or removed
		be present, but recent	disrupted.	entirely.
		channelization is not resent.	distupted.	i chimoty.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 Frequency of Riffles	Occurrence of riffles relatively	Occurrence of riffles	Occasional riffle or bend:	Generally all flat water or
, Troquency of Killies	frequent; spacing between	infrequent; distance between	bottom contours provide	shallow riffles; poor habitat;
	riffles 5 to 7 stream widths.	riffles divided by stream	some habitat; distance	distance between riffles
	Variety of habitat is key. In	width is between 7 to 15.	between riffles divided by	divided by stream width is >
	streams where riffles are		stream width is between 15	than 25.
	continuous, boulders or logs		to 25.	
	are important.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of	Moderately stable,	Moderately unstable, 30-60%	Unstable, many eroded areas
-	erosion or bank failure absent	infrequent, small areas of	of bank in reach has areas of	"raw" areas frequently along
	or minimal; little potential for	erosion mostly healed over.	erosion, high erosion	straight sections and bends;
	future problems. <5% of bank	5-30% of bank in reach has	potential during floods.	obvious bank sloughing; 60-
	affected.	areas of erosion.		100% of bank has erosional
CCOPE	I C Dark 10 0	8 7 6	5 4 3	scars. 2 1 0
SCORE (LB)	Left Bank 10 9	· · · ·	3 4 3	2 1 0
SCORE	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
(RB)	Right Dank 10			
	More than 90% of the	70-90% of the streambank	50-70% of the streambank	Less than 50% of the
9. Vegetative Protection	streambank surfaces and	surfaces covered by native	surfaces covered by	streambank surfaces covered
(score each bank)	immediate riparian zone	vegetation, but one class of	vegetation; disruption	by vegetation; disruptive of
(Score each bank)	covered by native vegetation,	plants is not well-	obvious; patches of bare soil	streambank vegetation is
	including trees, understory	represented; disruption	or closely cropped vegetation	very high; vegetation has
	shrubs, or nonwoody	evident but not affecting full	common; less than one-half	been removed to 5
	macrophytes; vegetative	plant growth potential to any	of the potential plant stubble	centimeters or less in averag
	disruption through grazing or	great extent; more than one-	height remaining.	stubble height.
	mowing minimal or not	half of the potential plant		
	evident; almost all plants	stubble height remaining.		
	allowed to grow naturally.			-
SCORE	Left Bank 10 9	8 7 6	5 4 3	2 1 0
(LB)				
SCORE	Right Bank 10 9	8 7 6	5 4 3	2 1 0
(RB)		77777	177.14	With Circles of
10. Riparian Vegetative	Width of riparian zone > 18	Width of riparian zone 12-18	Width of riparian zone 6-12	Width of riparian zone <6
Zone Width (score	meters; human activities (i.e.,	meters; human activities have	meters; human activities have	meters; little or no riparian
each bank riparian	parking lots, roadbeds, clear-	impacted zone only	impacted zone a great deal.	vegetation due to human
zone).	cuts, lawns, or crops) have not	minimally.		activities.
CCORE	impacted zone	0 7 /	F 4 2	2 1 0
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
(LB)	I			
	D: 14 D 2 40 0	0 = 1		
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

STREAM NAME: //	NT-13		LOC	ATION:	Ass#9		
STATION:	DRAINAGE	AREA (AC)	BASI	N/WATERSHE	D Big Sandy Ri	ver	
LAT: 38-05-35.3	LONG:	82-38-18.7	cou	NTY; L	awrence USGS 7.5 TO	PO;	
DATE: 2-11-09	TIME:	_ Ø AM 🗆	PM INVE	ESTIGATORS;	Rob Lewis, Rick	Heil	
TYPE SAMPLE: P-CH			J FISH 🗖 BA				
WEATHER: No		24 hours			rain in the last 7 days?		
	□ Ste	eavy rain eady rain termittent showers	✓Yes Air temper	□No rature 55 Cloud Cover	°F. Inches rai	nfall in past 24 hours	in
P-Chem: Temp (°F)		ear/sunny	% Saturation	nH(S.U.) Cond. ₁	s 159 🗖 Grab	
		(mg/i)	70 Saturation _	.pm(3.0.) Collu.p	5 137 L Glav	
INSTREAM WATERSHE FEATURES Stream Width EOW Stream Width BF Range of Depth Bankfull Depth Est. Reach Length	5 ft Property ft	Deep Mining Oil Wells	unding Land Use g		al □ Pastu □ Silvio	re/Grazing ulture I Runoff/Storm Sewers	
Hydraulic Structures:	1	<u> </u>	ream Flow;			ream Type;	
Dams DIsland DOther D	Waterfalls		y 🗖 Poole	ed □ Low Rapid or Torren	□ Normal □	Perennial Inter Ephemeral Seep	
Riparian Vegetation: Dominate Type: Trees Grasses Number of Strata		Dom. Tree/Shru Dogwood Oak Pine	ıb Taxa	☑ Partially ■		Channel Alterations; Dredging Channelization (D Full D Page 1988)	artial)
	1 P.C	Riffle	<u>"</u> %	Run;	80%	Pool 20	. %
Silt/Clay (<0.06 mm)					10	25	
Sand (0.06-2 mm)					10	25	
Gravel (2-64 mm) Cobble (64-256 mm)					10	25	
Boulders (>256 mm)							
Bedrock		-			70	25	
Habitat		1		Condition Ca	·····	23	
Parameter	Opt	imal	Subo	ptimal	Marginal	Poor	
	Greater than 709	% of substrate	40-70% mix of	stable habitat;	20-40% mix of stable ha	bitat; Less than 20-%	stable
1. Epifaunal	favorable for ep		well suited for		habitat availability less t	1	
Substrate/ Available	of snags, submer		colonization po adequate habita		desirable; substrate frequently disturbed or	obvious; substrate u or lacking.	ınstable
Cover	undercut banks,		maintenance of		removed.	or lacking.	
	stable habitat an		presence of add	litional			
	allow full coloni		substrate in the				
	(i.e., logs/snags fall and not trans		fall, but not yet colonization (n				
	101 010 1101	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	end of scale).	lay rate at mgm		\	
SCORE		18 17 16		3 12 11	10 9 8 7	5 4 3 2 1	0
	Gravel, cobble,		Gravel, cobble,	and boulder	Gravel, cobble, and boul	der Gravel, cobble, and	
2. Embeddedness	particles are 0-2:		particles are 25		particles are 50-75%	boulder particles are	
	by fine sediment cobble provides		surrounded by	une seaiment.	surrounded by fine sedin	than 75% surrounde fine sediment.	и ву
	niche space.					inc sommen.	
SCORE		18 17 16	15 14	13 12 11	10 9 8 7 6	5 4 3 2 1	0
	All four velocity		Only 3 of the 4		Only 2 of the 4 habitat	Dominated by 1	
3. Velocity/Depth Regime	present (slow-de		present (if fast-		regimes present (if fast-	velocity/depth regin	ne.
	shallow, fast-dee Deep > 1.5 feet.	p, tast-shallow.	missing, score missing other re		shallow or slow shallow missing, so ore low)	are	
SCORE		18 17 16		13 12 11	10 8 7 6	5 4 3 2 1	0

beposition bars and less than 5% of the bottom affected by sediment deposition. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 6 6 Were banks, and minimal amount of channel substrate is exposed. SCORE 20 19 18 17 16 Water fields by sediment deposition in pools. SCORE 20 19 18 17 16 Water fields by sediment deposition of process deposition of pools and new bars; as obstructions, constrictions, and bends; moderate deposition of pools and	4 C-1:4	Little or no onlargement of	Some new increase in bar	Moderate deposition of new	Heavy deposits of fine
dam 5% of the bottom affected by sediment deposition. SCORE 20 19 18 17 16 S. Channel Flow Status Water reaches base of tooth bottom factorical slight deposition in police. SCORE 20 19 18 17 16 S. Channel Alteration SCORE 20 19 18 17 16 Channel Alteration Channel Alteration Channel Alteration Channel Alteration Channel Status SCORE 20 19 18 17 16 Channel Alteration Channel Status Channel Status SCORE 20 19 18 17 16 Channel Alteration Channel Status Channel Status Channel Status Channel Status SCORE 20 19 18 17 16 Channel Alteration Channel Status Channe	4. Sediment Deposition	Little or no enlargement of islands or point bars and less			
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 2 76 15 4 3 2 1 0 10 16 15 14 13 12 11 10 9 8 7 6 15 4 3 2 1 0 10 16 15 14 13 12 11 10 9 8 7 6 15 4 3 2 1 0 10 16 16 15 14 13 12 11 10 9 8 7 6 15 14 13 12 11 1	Deposition	than 5% of the bottom affected			
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 7 6 5 4 3 2 1 0 evaluation frequently pools almost absorbed to substantial sediment deposition. Services of substantial sediment deposition. Services of substantial sediment deposition. Services of channel substrate is exposed. SCORE 20 19 18 17 16 Water fills > 75% of the available channel, under fills substrate are mostly exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 20 19 18 17 16 Services of channel substrate is exposed. SCORE 30 19 18 17 16 Services of channel substrate is exposed. SCORE 30 19 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCORE 10 18 18 17 16 Services of channel substrate is exposed. SCOR			•		
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 7 6 5 4 3 2 1 0 Water risks and minimal amount of channel substrate is exposed. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Water fills 25-75% of the available channel and the composition is not present. In th		by seament deposition.			
SCORE SCORE 20 19 18 17 16 5. Channel Flow Status Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE 20 19 18 17 16 6. Channel Alteration Channel: Annual					
SCORE 20 19 18 17 16 User Gland Substrate is exposed. SCORE 20 19 18 17 16 Stands, and minimal amount of channel substrate is exposed. SCORE 20 19 18 17 16 Channel Alteration Channel Channel Stream with normal pattern. Channel Alteration or developing the stream with correct patterns. SCORE 20 19 18 17 16 Cocurrence of fiftles relatively frequent; spacing between riffles of stream with channelization is not present. Channelization, i.e., dredging, greater than past 20 yr, may be subtracted. SCORE 20 19 18 17 16 Cocurrence of fiftles relatively frequently space in protein in the present, but recent in channelization, i.e., dredging, greater than past 20 yr, may be subtracted and disrupted. SCORE 20 19 18 17 16 Cocurrence of fiftles relatively frequently space in the present in the subtract of the present in the subtract of the present in the		1	pools.		
SCORE 20 19 18 17 16					·
SCORE 20 19 18 17 16 Channel Alteration Changi and pattern. SCORE 20 19 18 17 16 Channel Alteration Changi absent or minimal; stream with normal pattern. SCORE 20 19 18 17 16 Channel Alteration Changi absent or minimal; stream with normal pattern. SCORE 20 19 18 17 16 Courrence of riffles relatively General stable patterns of the streambank stable evidence of pass are important. SCORE 20 19 18 17 16 Courrence of riffles relatively General stable, relatively of relative possible or minimal; ittel approximal, stream with streams where riffles a for 3 stream reach channelized and sistupted. SCORE 20 19 18 17 16 Courrence of riffles relatively General stable, relatively of relative possible or difference of riffles relatively of relative possible streams continuous, boulders or logs are important. SCORE 20 19 18 17 16 SCORE 30 19 18 17 16 SCORE 4 Left Bank 10 9 Veggtative Proceed to the streambank surfaces and incomplytes; vegetative disruption through grazing or moving minimal or not evident; almost all plants allowed to grow maturally. SCORE (LB) SCORE (LB) Right Bank 10 9 Veggtative Proceed to the streambank surfaces and incomplytes; vegetative represented, disruption through grazing or moved that prophytes; vegetative revident; almost all plants allowed to grow maturally. SCORE (LB) SCORE (RB) Right Bank 10 9 Veggtative Proceed by native vegetation; including trees, understool grow maturally. SCORE (LB) SCORE (RB) Right Bank 10 9 Veggtative Zone Width (score each bank riparina zone) 218 Vegotation process the streambank surfaces covered by native vegetation and process thank riparina zone 20 than	SCORE	20 19 18 17 16	15 14 13 12 11		5 4 3 2 1 0
a wailable channel; or <25% constitution cons					Very little water in channel
score and an anomat of channel substrate is exposed. SCORE 10 19 18 17 16 Channel Alteration Channel Cathorite (1) 15 14 13 12 11 SCORE 20 19 18 17 (16) Courrence of rifflers estate (1) 15 14 13 12 11 Trequency of Riffles SCORE 20 19 18 17 (16) Courrence of rifflers estate (1) 15 14 13 12 11 SCORE 20 19 18 17 (16) Courrence of rifflers estate (1) 15 14 13 12 11 SCORE 20 19 18 17 (16) SCORE 20 19 18 17 (16) SCORE 30 20 19 18 17 (16) Courrence of rifflers estate (1) 15 14 13 12 11 SCORE 20 19 18 17 (16) SCORE 30 30 18 17 16 Courrence of rifflers estate (1) 15 14 13 12 11 SCORE 40 19 18 17 (16) SCORE 50 19 18 17 (16) SCORE 40 19 18 17 (16) SCORE 50 19 18 17 (16) SCORE 50 19 18 17 (16) SCORE 50 19 18 17 (16) SCORE 60 19 18 18	5. Charlier Flow Status			available channel, and/or	and mostly present as
SCORE 20 19 18 17 16 Channel Alteration Channel Al				riffle substrates are mostly	standing pools.
SCORE 20 19 18 17 16 15 14 13 11 10 9 8 7 6 5 4 3 2 1 0 0 0 0 0 0 0 0 0		******	exposed.	exposed.	
Chamelization or dredging about the minimal; stream with normal pattern. SCORE 20 19 18 17 16 Occurrence of riffles ferently the pattern of chamelization is not present, but recent chamelization is not present. SCORE 20 19 18 17 16 Occurrence of riffles ferently the pattern of chamelization is not present. SCORE 20 19 18 17 16 Occurrence of riffles from the pattern of the pattern of chamelization is not present. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream widths. Variety of habita is key. In streams where riffles are continuous, boulders or loss are important. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 7 to 15. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. SCORE 20 19 18 17 16 Occurrence of riffles divided by stream width is between 15 to 25. Moderately stable, Good over continuous of crossion mostly healed over. Control of the streambank surfaces over of by native vegetation of surfaces of covered by native vegetation by stream width is occurrence of riffles divided by stream of the occurrence of recision mostly healed over. Occurrence of riffles divided by stream width is occurrence of reci	SCORE				5 4 3 2 1 0
absent or minimal; stream with normal pattern. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0 0 0 0 0 0 0 0				Channelization may be	Banks shored with gabion of
abutments; evidence of past channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present, but recent channelization is not present. In the past 20 yr.) may be present on bottom contours provide nitrogent will fish set were niffles of the bottom contours provide some habitat, distance between riffles divided by stream width is between 15 to 25. SCORE					
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 6 5 4 3 2 1 0 0 0 0 0 0 0 0 0				shoring structures present on	stream reach channelized and
SCORE 20 19 18 17 16					disrupted. Instream habitat
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0 0 0 0 0 0 0 0				stream reach channelized and	greatly altered or removed
SCORE 20 9 18 17 6				disrupted.	entirely.
SCORE Courrence of riffles relatively Courrence of riffles relatively of habitat is key. In streams where riffles are continuous, boulders or logs are important. SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6					
Coccurrence of riffles requent; spacing between riffles to 7 stream widths. Variety of habitat is key. In streams where riffles are continuous, boulders or logs are important. SCORE	SCORE	20 19 18 17 16			
frequent; spacing between riffles of to? Stream widths. Variety of habitat is key. In streams where riffles are continuous, boulders or logs are important. SCORE 20 19 18 17 16 8. Bank Stability Banks stable; evidence of riure problems. <5% of bank in reach has areas of rension or bank failure absent or minimal; little potential for future problems. <5% of bank in reach has areas of erosion. SCORE (Left Bank 10 9 Right Bank 10 9 Rogetative Brown babitative description of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or moving minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (LB) Right Bank 10 9 Right Bank 10 9 Left Bank 10 9 Left Bank 10 9 Left Bank 10 9 Right Bank 10 9 Left Bank 10 9 Left Bank 10 9 Right Bank 10 9 Left Bank 10 9 Left Bank 10 9 Left Bank 10 9 Left Bank 10 9 Right Bank 10 9 Left Bank 10 9 Right Bank 10 9 Left Bank 10 9 Right Bank 10 9 Left Bank 10 9 Left Bank 10 9 Right Bank 10 9 Right Bank 10 9 Left Bank 10 9 Right Bank 10 9 Ri			Occurrence of riffles		
Variety of habitat is key. In streams where riffles are continuous, boulders or logs are important. SCORE 20 19 18 17 16 8. Bank Stability Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. SCORE (LB) SCORE Right Bank 10 9 Vegetative Protection (score each bank) Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Protection (score each bank) SCORE Right Bank 10 9 Vegetative Depth on the call plants allowed to grow naturally. SCORE (LB) SCORE Right Bank 10 9 Width of riparian zone > 18 Right Bank 10 9 Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. Width of riparian zone 2 a great deal. Width of	. ,	frequent; spacing between			shallow riffles; poor habitat;
SCORE SCORE SCORE SCORE Search important. SCORE		riffles 5 to 7 stream widths.	riffles divided by stream		
SCORE			width is between 7 to 15.		
SCORE SCORE SCORE SCORE Score ach bank) SCORE SC		streams where riffles are		stream width is between 15	than 25.
SCORE Bank Stability Banks stable; evidence of crossion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. Moderately stable, infrequent, small areas of crossion, high crossion potential during floods. Moderately unstable, 30-60% of bank in reach has areas of crossion, high crossion potential during floods. SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0		continuous, boulders or logs		to 25.	
Bank Stability Banks stable; evidence of erosion or bank failure absent or minimal, little potential for future problems. <5% of bank affected. SCORE (LB) SCORE (RB) Nore than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (RB) Nore than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (RB) SCORE (RB) Right Bank 10 9 SCORE (LB) Right Bank 10 9 SCORE (LB) SCORE (LB) SCORE (LB) SCORE Right Bank 10 9 SCORE (LB) SCORE Right Bank 10 9 SCORE Right Bank 10 9 SCORE (LB) SCORE Right Bank 10 9 SCORE Right		are important.			
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Future problems. <5% of bank affected. SCORE (LB) Right Bank 10 9 Right Bank 10 9 Robust of the streambank surfaces and dimmediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (RB) Left Bank 10 9 Right Bank 10 9	_				
Affected. SCORE (LB) SCORE (RB) (RB) 9. Vegetative Protection (score each bank) macrophytes; vegetative disruption through grazing or moving minimal or not evident; almost all plants allowed to grow naturally. SCORE (RB) SCORE (LB) SCORE (RB) 9. Vegetative Protection (score each bank) SCORE (RB) 9. Vegetative Protection (score each bank) SCORE (LB) SCORE (LB) SCORE (LB) SCORE (LB) SCORE (LB) SCORE (RB) Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone Right Bank 10 9 8 7 6 5 4 3 2 1 0 SCORE (CB) 70-90% of the streambank surfaces covered by native vegetation, but one clasps of powe to pative vegetation, but one clasps of powe to pative vegetation, but one clasps of powe vegetation, but one clasps of powe vegetation; disruption ocommon; less than one-half of the potential plant stubble height remaining. SCORE (LB) Width of riparian zone > 18 meters; human activities have impacted zone only minimally. SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 6-12 meters; human activities have impacted zone only minimally. SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 6-12 meters; human activities have impacted zone agreat deal. Width of riparian zone <6 meters; little or no riparian vegetation due to human activities. SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 6-12 meters; human activities have impacted zone agreat deal. SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right or no riparian zone 6-6 meters; little or no riparian vegetation due to human activities. SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0				,	
SCORE (LB) Right Bank 10 9 Right Bank 10 9 Vegetative Protection (score each bank) SCORE (RB) Nore than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (LB) Right Bank 10 9 Right Bank 10	1	future problems. <5% of bank	1	potential during floods.	
SCORE (LB) Right Bank 10 9 Rocore each bank) Score each bank) Right Bank 10 9 Rocore each bank) Right Bank 10 9		affected.	areas of erosion.		
SCORE (RB) 9. Vegetative Protection (score each bank) (score each bank) SCORE (RB) 9. Vegetative Protection (score each bank) (score each bank) SCORE (LB) SCORE (LB) SCORE (LB) 10. Riparian Vegetative Zone Width (score each bank riparian zone). SCORE (LB) SCO					
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Registrative Protection (score each bank) Score each bank Inparian zone	(LB)				
9. Vegetative Protection (score each bank) Score each bank Score each bank riparian zone Score each bank ri		Right Bank 10 9	8 7 6	5 4 3	2 1 0
Protection (score each bank) Protection (score each bank) Score each bank in each covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant great extent; more than one-half of the potential plant stubble height remaining. Score (RB) Score Width (score each bank riparian zone). Score Width (score each bank riparian zone). Score (LB) Score (LB) Score Right Bank 10 9 Score Right Ba	(RB)				
SCORE CLB SCOR	9. Vegetative	More than 90% of the			
covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) Right Bank 10 9 Right Bank 10 9 Right Grope Width (score each bank riparian zone). Width of riparian zone). Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone SCORE (LB) Right Bank 10 9 Right Bank 10 9	Protection	streambank surfaces and			•
including trees, understory shrubs, or nonwoody maturby, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone). Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone SCORE (LB) SCORE (LB) Right Bank 10. Riparian Vegetative each bank riparian zone). Width of riparian zone of the potential plant stubble height remaining. Width of riparian zone 12-18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone CRB SCORE (LB) Right Bank Right Right Remaining. Right Bank Right Bank Right Bank Right B	(score each bank)	immediate riparian zone	vegetation, but one class of	vegetation; disruption	
shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) Right Bank 10 9 (RB) Width of riparian zone > 18				obvious; patches of bare soil	
macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone). SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 12-18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 SCORE (LB) SCORE (Right Bank 10 9 8 7 6 5 4 3 2 1 0					
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mowing minimal or not evident; almost all plants allowed to grow naturally. SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Griparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 12-18 meters; human activities have impacted zone agreat deal. SCORE (LB) SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. SCORE (LB) SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0 SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0					
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SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0 Right Bank 10 9 8 7 6 5 4 3 2 1 0		macrophytes; vegetative disruption through grazing or	plant growth potential to any great extent; more than one-	of the potential plant stubble	1
SCORE (LB) SCORE (RB) Right Bank 10 9 8 7 6 5 4 3 2 1 0		macrophytes; vegetative disruption through grazing or mowing minimal or not	plant growth potential to any great extent; more than one- half of the potential plant	of the potential plant stubble	1
CLB SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0		macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants	plant growth potential to any great extent; more than one- half of the potential plant	of the potential plant stubble	1
SCORE (RB) Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0 Night Bank 10 9 8 7 6 5 4 3 2 1 0	SCODE	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	of the potential plant stubble height remaining.	stubble height.
Right Bank 10 Riparian Vegetative Zone Width (score each bank riparian zone). Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone Left Bank 10 9 8 7 6 5 4 3 2 1 0 SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0		macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	of the potential plant stubble height remaining.	stubble height.
10. Riparian Vegetative Zone Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone SCORE (LB) Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0	(LB)	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6	of the potential plant stubble height remaining.	stubble height.
Zone Width (score each bank riparian zone). Mathematical Content of the parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone Score	(LB) SCORE	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6	of the potential plant stubble height remaining.	stubble height.
each bank riparian zone). parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone SCORE (LB) Right Bank 10 9 8 7 6 5 4 3 2 1 0 SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0	(LB) SCORE (RB)	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 8 7 6	of the potential plant stubble height remaining. 5 4 3 5 4 3	2 1 0 2 1 0
Cuts, lawns, or crops) have not impacted zone minimally. activities.	(LB) SCORE (RB) 10. Riparian Vegetative	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9 Width of riparian zone > 18	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 8 7 6 Width of riparian zone 12-18	of the potential plant stubble height remaining. 5 4 3 5 4 3 Width of riparian zone 6-12	stubble height. 2 1 0 2 1 0 Width of riparian zone <6
SCORE Left Bank 10 9 8 7 6 5 4 3 2 1 0 SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0	(LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e.,	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 8 7 6 Width of riparian zone 12-18 meters; human activities have	of the potential plant stubble height remaining. 5 4 3 5 4 3 Width of riparian zone 6-12 meters; human activities have	stubble height. 2 1 0 2 1 0 Width of riparian zone <6 meters; little or no riparian
SCORE (LB) Left Bank (10) 9 8 7 6 5 4 3 2 1 0 SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0	(LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 Width of riparian zone 12-18 meters; human activities have impacted zone only	of the potential plant stubble height remaining. 5 4 3 5 4 3 Width of riparian zone 6-12 meters; human activities have	stubble height. 2 1 0 2 1 0 Width of riparian zone <6 meters; little or no riparian vegetation due to human
(LB) SCORE Right Bank 10 9 8 7 6 5 4 3 2 1 0	(LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian	macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not	plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 Width of riparian zone 12-18 meters; human activities have impacted zone only	of the potential plant stubble height remaining. 5 4 3 5 4 3 Width of riparian zone 6-12 meters; human activities have	stubble height. 2 1 0 2 1 0 Width of riparian zone <6 meters; little or no riparian vegetation due to human
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STREAM NAME: INT-14 LOCATION: Ass#7	
STATION: DRAINAGE AREA (AC) BASIN/WATERSHED Big Sandy River	
LAT: 38-05-45.6 LONG: 82-38-18.6 COUNTY; Lawrence USGS 7.5 TOPO;	
DATE: 2-11-09 TIME: : Z AM DPM INVESTIGATORS; Rob Lewis, Rick Heil	
TYPE SAMPLE: P-CHEM Macroinvertebrate FISH BACT.	
WEATHER: Now Past 24 hours Has there been a heavy rain in the last 7 days?	
☐ ☐ Heavy rain ☐ Yes ☐ No	
	in
☑ Intermittent showers 100 % Cloud Cover	
P-Chem: Temp (°F) 43.6 D.O. (mg/l) % Saturation pH(S.U.) Cond.µs 270 ☐ Grab	
INSTREAM WATERSHED FEATURES LOCAL WATERSHED FEATURES:	
FEATURES LOCAL WATERSHED FEATURES: Stream Width EOW 1.5 ft Predominant Surrounding Land Use:	
Stream Width BF 3.5 ft Surface Mining Construction Forest	
Range of Depth 0.1-0.2 ft Deep Mining Commercial Pasture/Grazing	
Bankfull Depth 0.5 ft \square Oil Wells \square Industrial \square Silviculture	
Est. Reach Length ft	
Hydraulic Structures: Stream Flow; Stream Type; □ Dams □ Bridge Abutments □ Dry □ Pooled □ Low □ Normal □ Perennial ☑ Intermitten	nt
□ Dams □ Bridge Abutments □ Dry □ Pooled □ Low □ Normal □ Perennial ☑ Intermitten □ Island □ Waterfalls ☑ High □ Very Rapid or Torrential □ Ephemeral □ Seep	.11
Other Culverts	
Riparian Vegetation: Dom. Tree/Shrub Taxa Canopy Cover; Channel Alterations;	_
Dominate Type: Dominate Type: Z Fully Exposed (0-25%) Dredging	
☐ Trees ☐ Shrubs Walnut ☐ Partially Exposed (25-50%) ☐ Channelization	
☐ Grasses ☐ Herbaceous Oak ☐ Partially Shaded (50-75%) ☐ Full ☐ Partial)	,
Number of Strata 1 Pine	
Substrate ☑ Est. □ P.C Riffle _ ' _ % Run; _ 100 _ % Pool %	
Silt/Clay (<0.06 mm) 20	_
Sand (0.06-2 mm) 40	
Gravel (2-64 mm) 30 Cobble (64-256 mm) 10	
Cobble (64-256 mm) 10 Boulders (>256 mm)	
Bedrock	
Habitat Condition Category	
Parameter Optimal Suboptimal Marginal Poor	_
Greater than 70% of substrate 40-70% mix of stable habitat; 20-40% mix of stable habitat; Less than 20-% stable	
1. Epifaunal favorable for epifaunal well suited for full habitat availability less than habitat" lack of habitat is	
Substrate/ colonization and fish cover; mix colonization potential; desirable; substrate obvious; substrate unstable Available of snags, submerged logs, adequate habitat for frequently disturbed or or lacking.	le
Available of snags, submerged logs, adequate habitat for frequently disturbed or or lacking. Cover undercut banks, cobble or other maintenance of populations; removed.	
stable habitat and at stage to presence of additional	
allow full colonization potential substrate in the form of new	
(i.e., logs/snags that are <u>not</u> new fall, but not yet prepared for	
fall and not transient. colonization (may rate at high end of scale).	
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0	
Gravel, cobble, and boulder Gravel, cobble, cobble, and boulder Gravel, cobble, and boulder Gravel, cobble, cobble, cobble, cobble, cobble, co	
2. Embeddedness particles are 0-25% surrounded particles are 25-50% particles are 50-75% boulder particles are more	e
by fine sediment. Layering of surrounded by fine sediment. surrounded by fine sediment. than 75% surrounded by	
cobble provides diversity of fine sediment.	
niche space.	
SCORE 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0	
All four velocity/depth regimes Only 3 of the 4 regimes Only 2 of the 4 habitat Dominated by 1	
2 Value / Double Project 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
3. Velocity/Depth Regime present (slow-deep, slow- present (if fast-shallow is regimes present (if fast- velocity/depth regime.	
3. Velocity/Depth Regime present (slow-deep, slow-shallow, fast-deep, fast-shallow. Deep > 1.5 feet. present (if fast-shallow is missing, score lower than if missing, other regimes) regimes present (if fast-shallow or slow shallow are missing, score low) velocity/depth regime.	

1///							
4. Sediment Deposition SCORE	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. 20 19 18 17 16	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of profis revalent.				
5. Channel Flow Status	Water reaches base of both	Water fills > 75% of the	10 9 7 6 Water fills 25-75% of the	5 4 3 2 1 0 Very little water in channel			
	lower banks, and minimal amount of channel substrate is exposed.	available channel; or <25% of channel substrate is exposed.	available channel, and/or riffle substrates are mostly expose.	and mostly present as standing pools.			
SCORE	20 19 18 17 16	15 14 13 12 11	1 9 8 7 6	5 4 3 2 1 0			
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
7 Frequency of Riffles	Occurrence of riffles relatively frequent; spacing between riffles 5 to 7 stream widths. Variety of habitat is key. In streams where riffles are continuous, boulders or logs are important.	Occurrence of riffles infrequent; distance between riffles divided by stream width is between 7 to 15.	Occasional riffle or bend: bottom contours provide some habitat; distance between riffles divided by stream width is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width is > than 25.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.			
SCORE	Left Bank 10 9	, 8 7 6	5 (4) 3	2 1 0			
(LB)			—				
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0			
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.			
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0			
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0			
10. Riparian Vegetative Zone Width (score each bank riparian zone). SCORE	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone Left Bank 10 9	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. 5 4 3	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.			
(LB) SCORE	Right Bank 10 9						
(RB)	Aight Dalik 10 9	8 7 6	5 4 3	2 1 0			

	IIIgii	Jiadicht Stree	uni Butti Billio		
STREAM NAME: INT	-15	LOCA	TION:	4ss#5	
STATION:	DRAINAGE AREA (AC)	BASIN	N/WATERSHED	Big Sandy Rive	er
LAT: 38-06-05.3	LONG: 82-38-14.9	COUN	ITY; <u>La</u> n	vrence USGS 7.5 TO	PO;
DATE: 2-10-09			STIGATORS;	Rob Lewis, Rick H	leil
TYPE SAMPLE: P-CHE	M	☐ FISH ☐ BA	CT.		
WEATHER: Now		Has there	been a heavy ra	in in the last 7 days?	
	☐ Heavy rain	✓Yes	□No		C.H.: and 24 hours in
	☐ Steady rain	Air temper		°F. Inches rain	Ifall in past 24 hours in
	☑ Intermittent showe ☐ Clear/sunny	rs <u>100</u> %	Jioud Cover		
P-Chem: Temp (°F)	41.6 D.O. (mg/l)	% Saturation	pH(S.	U.) Cond.μ	S 192 Grab
INSTREAM WATERSHED)	_			
FEATURES	LOCAL WATE				ļ
Stream Width EOW 1.5	ft Predominant Suri				
Stream Width BF 4	ft	-	☐ Construction		e/Grazing
Range of Depth $0.1-0.$		5	☐ Commercial	Pastur D Silvice	
Bankfull Depth 0.6	ft 🔲 Oil Wells	_	☐ Industrial		Runoff/Storm Sewers
Est. Reach Length	ft	al	☐ Row Crops		
Hydraulic Structures:		Stream Flow;			ream Type; Perennial Intermittent
□ Dams □		ory 🗖 Poole			
☐ Island ☐	Waterfalls	Iigh 🗖 Very	Rapid or Torrenti	al 🗖	Ephemeral
☐ Other ☑	Culverts				Channel Alterations;
Riparian Vegetation:	Dom. Tree/S	rub Taxa	Canopy Cover;	1 (0.250/)	Channel Alterations; Dredging
Dominate Type:			Fully Exp	Exposed (25-50%)	☑ Channelization
☐ Trees ☐	Shrubs Button bush			Shaded (50-75%)	(Full Partial)
	Herbaceous Cattail			ded (75-100%)	, (=
Number of Strata 2	Rush		Lany Sha	aca (10 10075)	
			<u> </u>		Pool 100 %
Substrate 🗹 Est. 🗆	P.C Riffle	<u> </u>	Run;	%	Pool <u>100</u> %
Silt/Clay (<0.06 mm)					20
Sand (0.06-2 mm)					10
Gravel (2-64 mm)			 		
Cobble (64-256 mm)					
Boulders (>256 mm) Bedrock					
Habitat			Condition Ca	tegory	Poor
Parameter	Optimal	Sub	optimal	Marginal 20-40% mix of stable ha	
	Greater than 70% of substrate	well suited fo	of stable habitat;	habitat availability less	
1. Epifaunal Substrate/	favorable for epifaunal colonization and fish cover; mix			desirable; substrate	obvious; substrate unstable
Available	of snags, submerged logs,	adequate habi		frequently disturbed or	or lacking.
Cover	undercut banks, cobble or other	maintenance of	of populations;	removed.	
	stable habitat and at stage to	presence of a			
	allow full colonization potentia		e form of new et prepared for		
	(i.e., logs/snags that are not new fall and not transient.		may rate at high		
	ian and not dampone	end of scale).			
SCORE	20 19 18 17 16	15 14	13 12 11	10 /	6 5 4 3 2 1 0
	Gravel, cobble, and boulder		e, and boulder	Gravel, cobble, and bou	boulder particles are more
2. Embeddedness	particles are 0-25% surrounded	particles are		surrounded by fine sedi	· · · · · · · · · · · · · · · · · · ·
	by fine sediment. Layering of	surrounded by	y fine sediment.	Surrounded by Time Sedi	fine sediment.
	cobble provides diversity of niche space.				
SCORE	20 19 18 17 16	15 14	13 12 11	1	6 5 4 3 2 1 0
	All four velocity/depth regimes	Only 3 of the		Only 2 of the 4 habitat	Dominated by 1
3. Velocity/Depth Regime	present (slow-deep, slow-	present (if fas		regimes present (if fast	velocity/depth regime.
	shallow, fast-deep, fast-shallow		e lower than if	shallow or slow shallow missing, score ow)	v ale
	Deep > 1.5 feet.	missing other	13 12 11		6 5 4 3 2 1 0
SCORE	20 19 18 17 16	15 14	10 14 11		

INT - 15							Т	** 1		
Deposition	Little or no enlargement of islands or point bars and le than 5% of the bottom affe by sediment deposition.	formation, r gravel, sand 5-30% of the affected; sli pools.	or fine sedin e bottom ght depositio	ment; on of ob an de	loderate deporavel, sand or nold and new f the bottom additional deposition, cond bestructions, cond bends; more position of p	r fine so w bars; affected sits at constrict oderate pools p	ediment 30-50% d; etions, revalent.	Heavy depormaterial, inc developmen of the botton frequently; p absent due t sediment de	reased t t; more n chang pools all o substa position	oar than 50% ing most ntial
SCORE	20 19 18 17	16 15 14	13 12			8 7		5 4		
	Water reaches base of both lower banks, and minimal amount of channel substra- exposed.	available ch	> 75% of the nannel; or <25 substrate is	5% av	Vater fills 25- vailable chan iffle substrate xroses	mel, an	d/or	Very little v and mostly standing po	present ols.	as
SCORE	20 19 18 17	16 15 14	13 12	11	10 9	8 7	6	5 4		1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream normal pattern.	with usually in a abutments; channelizat (greater that be present,	nelization pre reas of bridge evidence of pi ion, i.e., dred n past 20 yr.) but recent ion is not pre	e expast sh lging, bo) may str di	Chamelization extensive; emboring struct both banks; and tream reach of disrupted.	bankm ures pr nd 40-8	ents or esent on 80% of	Banks short cement; over stream react disrupted. greatly alte entirely.	er 80% o h chann Instrean	of the elized and habitat
	20 10 10 17				10 9	8) 7	6	5 4	3 2	1 0
SCORE 7 Frequency of Riffles	Occurrence of riffles relat frequent; spacing between riffles 5 to 7 stream width Variety of habitat is key. I streams where riffles are continuous, boulders or loare important.	ively Occurrence infrequent; riffles divided width is be		ween bo	Occasional ripottom conton come habitat; between riffle stream width to 25.	urs pro distances divide	bend: vide ce led by	Generally a shallow rift distance be divided by than 25.	Il flat w les; poo tween ri	rater or or habitat; ffles
SCORE	20 19 18 17	16 15 14	13 12	11	10 9	8 7	6	5 4	3 2	
8. Bank Stability	Banks stable; evidence of erosion or bank failure ab or minimal; little potentia future problems. <5% of affected.	sent infrequent, of for erosion mo	small areas o stly healed o oank in reach	of or	Moderately un of bank in reactories on the control of the control	erosion	areas of n ods.	Unstable, r "raw" area straight sec obvious ba 100% of ba scars.	s freque tions ar nk sloug ank has	ntly along ad bends; ghing; 60- erosional
SCORE (LB)	Left Bank 10	9 , 8	7 6		5	4	3	2	1	0
SCORE (RB)	Right Bank 10	9 8	7 6		5	4	3	2	1	0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetal including trees, understor shrubs, or nonwoody macrophytes; vegetative disruption through grazin mowing minimal or not evident; almost all plants allowed to grow naturally	surfaces or vegetation, plants is n represente evident bu plant grow great exter half of the stubble he	d; disruption t not affectin th potential t nt; more than potential pla ight remainir	ss of vone full to any one ful	50-70% of the surfaces cover vegetation; dobvious; pate or closely crecommon; les of the potent height remains	ered by lisruption ches of opped vision is than ial plan ning.	on bare soil vegetation one-half at stubble	by vegetat streamban very high; been remo	k surfaction; disr k vegetatived to 5 s or less	es covered uptive of tion is ion has
SCORE	Left Bank 10	9 8	7 6		5	4	3		1	U
(LB) SCORE	Right Bank 10	9 8	7 6		5	4	3	2	1	0
(RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > meters; human activities parking lots, roadbeds, cl cuts, lawns, or crops) have impacted zone	(i.e., meters; hu impacted		es have r	Width of rips meters; hum- impacted zon	an acti	vities have	Width of a meters; lit vegetation activities.	tle or no	riparian human
	Left Bank 10	9 8	7 6		5	4	3	2	1	0
SCORE (LB)				- 1				$\frac{1}{2}$	1	0

	Hi	gh Grad	dient Stream	n Data Sheet			
STREAM NAME: INT-1	6		LOCAT	ION: A	ss#3		
STATION:	DRAINAGE AREA (AC)		BASIN/	WATERSHED	Big Sandy River	r	
LAT: 38-06-16.1	LONG: 82-38-	5	COUNT	Y; Lawr	ence USGS 7.5 TOP	O;	
DATE: 2-10-07	IME: AN		<u> </u>	rigators;	Rob Lewis, Rick He	eil	
TYPE SAMPLE: P-CHEM		□ F	ISH BAC	on a heavy rait	n in the last 7 days?		
WEATHER: Now □ □ □ □ □ □ □	Past 24 hours ☐ Heavy rain ☐ Steady rain ☑ Intermittent sl ☐ Clear/sunny		✓Yes Air temperat	□No cure <u>70</u> ° oud Cover	F. Inches rainf		
P-Chem: Temp (°F)	42 D.O. (mg/l)	%	Saturation	pH(S.U	J.) Cond.µs		_ U Grab
INSTREAM WATERSHED FEATURES Stream Width EOW Stream Width BF Anage of Depth Bankfull Depth Est. Reach Length	ft Predominant	Surround Mining ining Is isposal	[[1	Construction Commercial Industrial Row Crops	☐ Pasture☐ Silvicu☐ Urban	e/Grazin liture Runoff/ eam Typ	Storm Sewers
	Waterfalls Culverts	Dry High		Rapid or Torrentia	☑ Normal □	Peren Epher	nial Intermittent
_ <u> </u>	Shrubs Herbaceous Willow	ee/Shrub	Taxa	☐ Partially S	sed (0-25%) xposed (25-50%) haded (50-75%) led (75-100%)	☐ D	oredging Channelization ☐ Full ☑ Partial)
Substrate ☑ Est. □	P.C Riffle	1/5	%	Run;	<u></u> %	Pool	<u>25</u> %
Silt/Clay (<0.06 mm)		25				 	25
Sand (0.06-2 mm)		50				 	25
Gravel (2-64 mm)		25		 			
Cobble (64-256 mm)						1	
Boulders (>256 mm)							
Bedrock				Condition Ca	tegory		
Habitat		—-т	Subo	ptimal	Marginal		Poor
Parameter 1. Epifaunal Substrate/ Available Cover	Greater than 70% of subst favorable for epifaunal colonization and fish cove of snags, submerged logs, undercut banks, cobble of stable habitat and at stage allow full colonization po (i.e., logs/snags that are n fall and not transient.	r; mix other to tential	40-70% mix o well suited for colonization p adequate habit maintenance o presence of ad substrate in the fall, but not ye	f stable habitat; full otential; tat for of populations; Iditional	20-40% mix of stable habitat availability less desirable; substrate frequently disturbed or removed.	than	Less than 20-% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17	16	15 14	13 12 11 e, and boulder	10 9 8 7 Gravel, cobble, and both	6 ulder	5 4 3 2 1 0 Gravel, cobble, and
2. Embeddedness	Gravel, cobble, and bould particles are 0-25% surro by fine sediment. Layerin cobble provides diversity niche space.	unded g of	particles are 2 surrounded by	25-50% y fine sediment.	particles are 50-75% surrounded by fine sed	iment.	boulder particles are more than 75% surrounded by fine sediment.
SCORE	20 19 18 17	16	15 14	13 12 11	10 9 8 7		Dominated by 1
3. Velocity/Depth Regime	All four velocity/depth represent (slow-deep, slow shallow, fast-deep, fast-speep > 1.5 feet.	hallow.	missing other	st-shallow is e lower than if r regimes)	Only 2 of the 4 habitat regimes present (if fast shallow or slow shallo missin, score low)	t-	velocity/depth regime.
SCORE	20 19 18 1	16	15 14	13 12 11	1 9 8 7	<u> </u>	

INT-16				11 1
Deposition i	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% or the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	10 10 17	chann azation is not present.	10 9 8 7 6	5 4 3 2 1 0
SCORE 7 Frequency of Riffles	20 19 18 17 16 Occurrence of riffles relatively frequent; spacing between riffles 5 to 7 stream widths. Variety of habitat is key. In streams where riffles are continuous, boulders or logs	Occurrence of riffles infrequent; distance between riffles divided by stream width is between 7 to 15.	Occasional riffle or bend: bottom contours provide some habitat; distance between riffles divided by stream width is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width is > than 25.
	are important.	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
SCORE 8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	15 14 13 12 11 Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE	Left Bank 10 9	8 7 6	5 4 3	2 1 0
(LB) SCORE	Right Bank 10 9	8 7 6	5 4 3	2 1 0
(RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0

		High Gra	idieni Sirea	III Data Shee			
STREAM NAME: INT-	17		LOCA	TION:	1ss#1		
STATION:	DRAINAGE A	REA (AC)	BASIN	/WATERSHED	Big Sandy Rive	er	
LAT: 38-06-19.6	LONG:	82-38-33.2	COUN	TY; Law	rence USGS 7.5 TO	PO;	
	IME:	□ AM ☑PN	•	STIGATORS;	Rob Lewis, Rick F.	leil	
TYPE SAMPLE: □ P-CHEN		vertebrate 🛛 I	ISH 🗆 BA	СТ			
WEATHER: Now	Past 24	hours	Has there b	oeen a heavy rai	in in the last 7 days?		
	☐ Hear	vy rain	☑Yes	□No	en Turken neim	.£all in n	oast 24 hours in
		ıdy rain	Air tempera	ture <u>68</u> °	F. Inches rain	nan m p	Jast 24 Hours
Ø			<u>100</u> % C	Cloud Cover			
		ar/sunny					37 F.Ch
P-Chem: Temp (°F)	47 D.O. (1	mg/l) %	Saturation _	pH(S.	U.) Cond.µ	<u> </u>	37 Grab
INSTREAM WATERSHED		o . v sv. mppci	TOP TO ATTIE	EC.			
FEATURES	1	CAL WATERSH					
Stream Width EOW 3.5		edominant Surroun Surface Mining		. ☐ Construction	n		
Stream Width BF 4	A D			☑ Commercial		e/Grazii	ng
Range of Depth $0.1-0.5$				☐ Industrial	☐ Silvic		
Bankfull Depth	n			☐ Row Crops	Urban	Runoff	Storm Sewers
Est. Reach Length	" J	•				T	mat
Hydraulic Structures:			am Flow;	. = .	_	ream Ty Pere	
Dams 🗖	Bridge Abutmer	nts Dry	Poole				emeral
10.0	Waterfalls	☑ High	⊔ Very	Rapid or Torrenti	aı —	Lpiic	inclui — Step
☐ Other ☑	Culverts					Chann	nel Alterations;
Riparian Vegetation:		Dom. Tree/Shrub	Taxa	Canopy Cover;	1 (0.250/)		Dredging
Dominate Type:		_		☑ Fully Expo	osed (0-25%) Exposed (25-50%)		Channelization
	Shrubs	Dogwood			Shaded (50-75%)		☑ Full ☐ Partial)
- 0145545	Herbaceous	Cedar			ded (75-100%))	,
Number of Strata 1		White Pine		L Tully Shace	ica (75 10070)		
						ļ	
Substrate Est.	P.C	Riffle	%	Run;	%	Pool	
Silt/Clay (<0.06 mm)							40
Sand (0.06-2 mm)		25				-	40
Gravel (2-64 mm)		50				 	20
Cobble (64-256 mm)		25				 	
Boulders (>256 mm)		<u> </u>				-	
Bedrock		1		Condition Ca	tegory		
Habitat	0-4	timal	Suho	optimal	Marginal		Poor
Parameter	Greater than 70°	timal % of substrate	40-70% mix o	f stable habitat;	20-40% mix of stable h		Less than 20-% stable
1. Epifaunal	favorable for ep		well suited for	full	habitat availability less	than	habitat" lack of habitat is
Substrate/	colonization and	I fish cover; mix	colonization p		desirable; substrate		obvious; substrate unstable or lacking.
Available	of snags, subme	rged logs,	adequate habit		frequently disturbed or removed.		Or Ideking.
Cover	undercut banks,		maintenance of ad	of populations;	Tellioved.	1	
	stable habitat an	nd at stage to ization potential	substrate in th	e form of new			
	(i.e. logs/enage	that are <u>not</u> new	fall, but not ye	et prepared for			
	fall and not tran		colonization (may rate at high			
			end of scale).		10 0 0 7	6	5 4 3 2 1 0
SCORE		18 17 16		13 12 11	10 9 8 7 Gravel, cobble, and boo		Gravel, cobble, and
	Gravel, cobble,	and boulder		e, and boulder	particles are 50-75%	atuci	boulder particles are more
2. Embeddedness		25% surrounded	particles are 2	5-50% fine sediment.	surrounded by fine sed	iment.	than 75% surrounded by
	by fine sediment cobble provides		Surrounded by	, mic semment.		•	fine sediment.
	niche space.	diversity of					
SCORE		18 17 16	15 14	13 12 11	10 9 8 7		5 4 3 2 1 0
500107		y/depth regimes	Only 3 of the	4 regimes	Only 2 of the 4 habitat		Dominated by 1
3. Velocity/Depth Regime	present (slow-d	leep, slow-	present (if fas	t-shallow is	regimes present (if fast	:-	velocity/depth regime.
5	shallow, fast-de	eep, fast-shallow.		e lower than if	shallow or slow shallo	w are	
	Deep > 1.5 feet		missing other		missing score low) 10 9 8 7	6	5 4 3 2 1 0
SCORE	20 19	18 17 16	15 14	13 12 11	10 9 8 7	U	<u> </u>

			7.4.1 C	Hanny demonite of fine
Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected	Some new increase in bar formation, mostly from gravel, sand or fine sediment;	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50%	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing
	by sediment deposition.	5-30% of the bottom affected; slight deposition in	of the bottom affected; sediment deposits at	frequently; pools almost
		pools.	obstructions, constrictions,	absent due to substantial
		pools.	and bends; moderate	sediment deposition.
			der osition of pools prevalent.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both	Water fills > 75% of the	Water fills 25-75% of the available channel, and/or	Very little water in channel and mostly present as
	lower banks, and minimal amount of channel substrate is	available channel; or <25% of channel substrate is	riffle substrates are mostly	standing pools.
	exposed.	exposed.	exposed.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging	Some channelization present,	Channelization may be	Banks shored with gabion of cement; over 80% of the
	absent or minimal; stream with	usually in areas of bridge abutments; evidence of past	extensive; embankments or shoring structures present on	stream reach channelized and
	normal pattern.	channelization, i.e., dredging,	both banks; and 40-80% of	disrupted. Instream habitat
		(greater than past 20 yr.) may	stream reach channelized and	greatly altered or removed
		be present, but recent	disrupted.	entirely.
	A0 10 10 15 17	channelization is not present	10 9 8 7 6	5 4 3 2 1 0
SCORE	20 19 18 17 16 Occurrence of riffles relatively	Occurrence of riffles	Occasional riffle or bend:	Generally all flat water or
7 Frequency of Riffles	frequent; spacing between	infrequent; distance between	bottom contours provide	shallow riffles; poor habitat;
	riffles 5 to 7 stream widths.	riffles divided by stream	some habitat; distance	distance between riffles divided by stream width is >
	Variety of habitat is key. In streams where riffles are	width is between 7 to 15.	between riffles divided by stream width is between 15	than 25.
	continuous, boulders or logs		to 25.	
	are important.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0 Unstable, many eroded areas
8. Bank Stability	Banks stable; evidence of	Moderately stable, infrequent, small areas of	Moderately unstable, 30-60% of bank in reach has areas of	"raw" areas frequently along
	erosion or bank failure absent or minimal; little potential for	erosion mostly healed over.	erosion, high erosion	straight sections and bends;
	future problems. <5% of bank	5-30% of bank in reach has	potential during floods.	obvious bank sloughing; 60-
	affected.	areas of erosion.		100% of bank has erosional
CODE	Left Bank 10 9	, 8 7 6	5 4 3	scars. 2 1 0
SCORE (LB)	Leit Dank 10 9			
SCORE	Right Bank 10 9	8 7 6	5 4 3	2 1 0
(RB)	_			į.
0 17			70 700/ Cd / 1 d	T then 600/ of the
9. Vegetative	More than 90% of the	70-90% of the streambank	50-70% of the streambank	Less than 50% of the
Protection	streambank surfaces and	surfaces covered by native	surfaces covered by	
	streambank surfaces and immediate riparian zone		surfaces covered by vegetation; disruption obvious; patches of bare soil	streambank surfaces covered by vegetation; disruptive of streambank vegetation is
Protection	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory	surfaces covered by native vegetation, but one class of plants is not well- represented; disruption	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has
Protection	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody	surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5
Protection	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative	surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5
Protection	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in averag
Protection	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average
Protection (score each bank)	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average
Protection (score each bank)	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
Protection (score each bank)	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
Protection (score each bank) SCORE (LB) SCORE (RB)	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 8 7 6	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 2 1 0
SCORE (LB) SCORE (RB)	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9 Width of riparian zone > 18	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 8 7 6 Width of riparian zone 12-18	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 5 4 3 Width of riparian zone 6-12	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 Width of riparian zone <6
SCORE (LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e.,	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 Width of riparian zone 12-18 meters; human activities have	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 5 4 3 Width of riparian zone 6-12	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 Width of riparian zone <6
SCORE (LB) SCORE (RB) 10. Riparian Vegetative	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Right Bank 10 9 Width of riparian zone > 18	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 8 7 6 Width of riparian zone 12-18	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 5 4 3 Width of riparian zone 6-12 meters; human activities have	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 Width of riparian zone <6 meters; little or no riparian
SCORE (LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone).	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 5 4 3 Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone).	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 Width of riparian zone 12-18 meters; human activities have impacted zone only	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 5 4 3 Width of riparian zone 6-12 meters; human activities have	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 Width of riparian zone <6 meters; little or no riparian vegetation due to human
SCORE (LB) SCORE (RB) 10. Riparian Vegetative Zone Width (score each bank riparian zone).	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. Left Bank 10 9 Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone	surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. 8 7 6 Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. 5 4 3 Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. 2 1 0 Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.

STREAM NAME: IN	T-18		LOCA	ATION:	Ass#2		
STREAM NAME: IIV.							
STATION:	DRAINAGE.	AREA (AC)	BASI	N/WATERSHEI) Big Sandy Ri	ver	
LAT: 38-06-23.3	LONG:	82-37-33.8	cour	NTY; La	wrence USGS 7.5 TO	OPO;	
DATE: 2-10-09	TIME:	□ AM Ø	M INVE	STIGATORS;	Rob Lewis, Rick	Heil	
TYPE SAMPLE: P-CHI	EM	invertebrate 🛛	FISH □ BA				
WEATHER: Nov	v Past 2	4 hours	Has there		ain in the last 7 days?		
	☐ He	avy rain	☑Yes	□No			
		ady rain	Air temper		°F. Inches rai	nfall in	past 24 hours in
		ermittent showers		Cloud Cover			
		ear/sunny	0/ 0-4	-IJ/C	S.U.) Cond. ₁	1	02
P-Chem: Temp (°F)		(mg/l)	% Saturation _	pH(S	Cond.		02 0140
INSTREAM WATERSHE		OCAL WATERS	HED FEATUR	RES:			
Stream Width EOW 4		edominant Surrou					
Stream Width BF 6	ft			☑ Construction	on	t	
Range of Depth $0.1-0$		-		☑ Commercia	al 🗖 Pastu	re/Graz	zing
Bankfull Depth /		Oil Wells		□ Industrial		culture	
Est. Reach Length	ft □	Land Disposal		☐ Row Crops	urba	n Runo	ff/Storm Sewers
		Ct.	El			tream T	Tyme:
Hydraulic Structures:	Duidas Abutus		ream Flow; Poole	ed 🗖 Low		l Per	
□ Dams □ Island □	Bridge Abutme Waterfalls	nts 🗖 Dry		Rapid or Torrent			nemeral
	Culverts	Œ IIIg	n 🗀 very	rapid of Torrem		- 2p.	
	Curverts	D 77 /C1	1. m	Canopy Cover		Char	nnel Alterations;
Riparian Vegetation:		Dom. Tree/Shru	b Taxa	☐ Fully Exp	; oosed (0-25%)		Dredging
Dominate Type: ☐ Trees ☐	Shrubs	Poplar Sumac			Exposed (25-50%)		Channelization
☑ Trees ☐ Grasses ☐	Herbaceous	Willow			Shaded (50-75%)	1	(D Full D Partial)
Number of Strata		Box elder			ded (75-100%)	ł	,
Trumber of Strata		Don true.			,		
		1				<u></u>	
Substrate 🗹 Est. 🗆	P.C	Riffle	0%	Run;	%	Pool	%
Silt/Clay (<0.06 mm)				<u> </u>		 	
Sand (0.06-2 mm)		20				 	
Gravel (2-64 mm)		60		ļ <u> </u>		+	
Cobble (64-256 mm)		20	<i>)</i>			+	
Boulders (>256 mm)						+	·
Bedrock	Г			Condition Ca	tegory		
Habitat Parameter	Ont	timal	Subo	ptimal	Marginal		Poor
I AI AINCLCI	Greater than 70°			f stable habitat;	20-40% mix of stable h	abitat;	Less than 20-% stable
1. Epifaunal	favorable for ep	ifaunal	well suited for	full	habitat availability less		habitat" lack of habitat is
Substrate/	colonization and	l fish cover; mix	colonization po		desirable; substrate		obvious; substrate unstable
Available	of snags, subme	rged logs,	adequate habit		frequently disturbed or		or lacking.
Cover	undercut banks,	cobble or other	maintenance o		removed.		
	stable habitat an		presence of ad substrate in the	uitional form of new			
	(i.e., logs/snags	•	fall, but not ye				
	fall and not trans			nay rate at high			
			end of scal).				
SCORE		18 17 16	10 11	13 12 11		6	5 4 3 2 1 0
	Gravel, cobble,		Gravel, cobble		Gravel, cobble, and box	ılder	Gravel, cobble, and
2. Embeddedness	particles are 0-2		particles are 2:		particles are 50-75%		boulder particles are more
·	by fine sedimen		surrounded by	fine sediment.	surrounded by fine sedi	ment.	than 75% surrounded by
	cobble provides	diversity of	1				fine sediment.
CCODE	niche space.	10 17 16	15 14	13 12 11	10 9 8 7	6	5 4 3 2 1 0
SCORE		18 17 16	15 14			· · · · ·	Dominated by 1
2 Valority/Danil Dani-	All four velocity present (slow-de		Only 3 of the a		Only 2 of the 4 habitat regimes present (if fast	_	velocity/depth regime.
3. Velocity/Depth Regime	shallow, fast-de		missing, score		shallow or slow shallow		. c.co.c.j. dopan i ogimio.
	Deep > 1.5 feet.		missing other		mi sing score low)		
SCORE		18 17 16		13 12 11	10 9 8 7	6	5 4 3 2 1 0
L			······································				

17/1/10		C	Moderate deposition of new	Heavy deposits of fine
4. Sediment	Little or no enlargement of	Some new increase in bar formation, mostly from	gravel, sand or fine sediment	material, increased bar
Deposition	islands or point bars and less than 5% of the bottom affected	gravel, sand or fine sediment;	on old and new bars; 30-50%	development; more than 50%
į	***************************************	5-30% of the bottom	of the bottom affected;	of the bottom changing
1	by sediment deposition.	affected; slight deposition in	sediment deposits at	frequently; pools almost
		pools.	obstructions, constrictions,	absent due to substantial
		pools.	and bends; moderate	sediment deposition.
			deposition of pools prevalent.	•
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both	Water fills > 75% of the	Water fills 25-75% of the	Very little water in channel
o. Chamer 1 10 Status	lower banks, and minimal	available channel; or <25%	available channel, and/or	and mostly present as
	amount of channel substrate is	of channel substrate is	riffle substrates are mostly	standing pools.
	exposed.	exposed.	exposed.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging	Some channelization present,	Channelization may be	Banks shored with gabion of
o. Chamier / meradon	absent or minimal; stream with	usually in areas of bridge	extensive; embankments or	cement; over 80% of the
	normal pattern.	abutments; evidence of past	shoring structures present on	stream reach channelized and
		channelization, i.e., dredging,	both banks; and 40-80% of	disrupted. Instream habitat
		(greater than past 20 yr.) may	stream reach channelized and	greatly altered or removed
		be present, but recent	disrupted.	entirely.
		channelization is na present.	_	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 Frequency of Riffles	Occurrence of riffles relatively	Occurrence of riffles	Occasional riffle or bend:	Generally all flat water or
	frequent; spacing between	infrequent; distance between	bottom contours provide	shallow riffles; poor habitat; distance between riffles
	riffles 5 to 7 stream widths.	riffles divided by stream	some habitat; distance	divided by stream width is >
	Variety of habitat is key. In	width is between 7 to 15.	between riffles divided by	· -
	streams where riffles are		stream width is between 15	than 25.
	continuous, boulders or logs		to 25.	
	are important.	15 14 12 12 11	10 9 8 7 6	5 4 3 2 1 0
SCORE	20 19 18 17 16	15 14 13 12 11	Moderately unstable, 30-60%	Unstable, many eroded areas
8. Bank Stability	Banks stable; evidence of	Moderately stable,	of bank in reach has areas of	"raw" areas frequently along
	erosion or bank failure absent	infrequent, small areas of erosion mostly healed over.	erosion, high erosion	straight sections and bends;
	or minimal; little potential for	5-30% of bank in reach has	potential during floods.	obvious bank sloughing; 60-
	future problems. <5% of bank	areas of erosion.	potential during noods.	100% of bank has erosional
	affected.	areas of crosion.		scars.
SCORE	Left Bank 10 9	8 7 6	5 4 3	2 1 0
(LB)				
SCORE	Right Bank 10 9	8 7 6	5 4 3	2 1 0
(RB)	1			
9. Vegetative	More than 90% of the	70-90% of the streambank	50-70% of the streambank	Less than 50% of the
Protection	streambank surfaces and	surfaces covered by native	surfaces covered by	streambank surfaces covered
(score each bank)	immediate riparian zone	vegetation, but one class of	vegetation; disruption	by vegetation; disruptive of
(Score cach bank)	covered by native vegetation,	plants is not well-	obvious; patches of bare soil	streambank vegetation is
	including trees, understory	represented; disruption	or closely cropped vegetation	very high; vegetation has
	shrubs, or nonwoody	evident but not affecting full	common; less than one-half	been removed to 5
	macrophytes; vegetative	plant growth potential to any	of the potential plant stubble	centimeters or less in average
	disruption through grazing or	great extent; more than one-	height remaining.	stubble height.
	mowing minimal or not	half of the potential plant		
	evident; almost all plants	stubble height remaining.		
	allowed to grow naturally.	1		2 1 0
SCORE	Left Bank 10 9	8 7 6	5 4 3	2 I U
(LB)		1 2 2	-	2 1 0
SCORE	Right Bank 10 9	8 7 6	5 4 3	2 1 U
(RB)		12.13	With Chinaria and 6 12	Width of ringrian zone /6
10. Riparian Vegetative	Width of riparian zone > 18	Width of riparian zone 12-18	Width of riparian zone 6-12	Width of riparian zone <6
	meters; human activities (i.e.,	meters; human activities have		meters; little or no riparian
Zone Width (score		impacted zone only	impacted zone a great deal.	vegetation due to human activities.
Zone Width (score each bank riparian	parking lots, roadbeds, clear-			
Zone Width (score	cuts, lawns, or crops) have not	minimally.		activities.
Zone Width (score each bank riparian zone).	cuts, lawns, or crops) have not impacted zone		6.	
Zone Width (score each bank riparian zone).	cuts, lawns, or crops) have not	minimally.	5 4 3	2 1 0
Zone Width (score each bank riparian zone). SCORE (LB)	cuts, lawns, or crops) have not impacted zone Left Bank 10 9	8 7 6		2 1 0
Zone Width (score each bank riparian zone).	cuts, lawns, or crops) have not impacted zone		5 4 3	

High Gradient Stream Data Sheet

STREAM NAME:	Ephemeral-TYPIC	`AI	100	CATION:	A#11		
					Ass#11		
STATION:	DRAINAGE	E AREA (AC)	BAS	SIN/WATERSH	ED Big	Sandy River	
LAT: 38-05-40	LONG:	82-38-29	COI	UNTY;	Lawrence USC	S 7.5 TOPO;	
DATE: 2-11-09	TIME:	<u>:</u> □ AM 5	Z PM INV	ESTIGATORS;	Rob Lev	ris, Rick Heil	
TYPE SAMPLE: P-C WEATHER: N		oinvertebrate [24 hours		BACT.			
WEATHER.		24 nours eavy rain	Has ther ☑Yes	e been a heavy	rain in the last	7 days?	
] □ St	eady rain termittent shower	Air temp		_ °F. I	nches rainfall	in past 24 hours in
P-Chem: Temp (°F)		ear/sunny (mg/l)	% Saturation	рН	(S.U.)	Cond.µs	104 □ Grab
INSTREAM WATERSH			·				
FEATURES Stream Width EOW Stream Width BF Range of Depth Bankfull Depth Est. Reach Length	ft P ft C 0.2 ft C	Deep Mining Oil Wells	ounding Land U		cial 🗹	Forest Pasture/Gra Silviculture Urban Run	
Hydraulic Structures:			tream Flow;			Stream	Туре;
Dams Island Dother	Waterfalls	ents Dr		ed		☐ Pe	rennial
Riparian Vegetation: Dominate Type:		Dom. Tree/Shr	ub Taxa	Canopy Cove		Cha	nnel Alterations;
☐ Trees ☐ Grasses ☐ Number of Strata		Oak Sycamore		☐ Partially ☐ Partially	xposed (0-25%) x Exposed (25-50% x Shaded (50-75%) aded (75-100%)		Dredging Channelization (□ Full □ Partial)
	■ P.C	Riffle	<u>′</u> %	Run;	100 %	Poo	l%
Silt/Clay (<0.06 mm) Sand (0.06-2 mm)					50		
Gravel (2-64 mm)					20 20		
Cobble (64-256 mm)					10		
Boulders (>256 mm) Bedrock							
Habitat	1	<u> </u>		<u> </u>			
Parameter	Ont	imal	Subo	Condition Captimal			T
	Greater than 70%			stable habitat;	Margi 20-40% mix of s		Poor
1. Epifaunal	favorable for epi	faunal	well suited for		habitat availabili		Less than 20-% stable habitat" lack of habitat is
Substrate/ Available	colonization and	fish cover; mix	colonization po		desirable; substra	ite	obvious; substrate unstable
Cover	of snags, submer undercut banks,		adequate habita maintenance of	it for f nonulations:	frequently distur	bed or	or lacking.
	stable habitat and		presence of add		removed.		
	allow full coloniz		substrate in the	form of new			
	(i.e., logs/snags t		fall, but not yet				
	ran and <u>not</u> trans	ient.	colonization (n end of scale).	ay rate at high			
SCORE	20 19 1	8 17 16		3 12 11	10 9 8	7 6	5(4) 2 1 2
	Gravel, cobble, a	nd boulder	Gravel, cobble,		Gravel, cobble, a		5 4 8 2 1 0 Gravel, cobble, and
2. Embeddedness	particles are 0-25	% surrounded	particles are 25		particles are 50-7	5%	boulder particles are more
	by fine sediment.	Layering of	surrounded by	ine sediment.	surrounded by fin	e sediment.	than 75% surrounded by
	niche space.	TACISITÀ OI					fine sediment.
SCORE	20 19 1	8 17 16	15 14	13 12 11	10 9 8	7 6	5 4 3 2 1 0
	All four velocity/	depth regimes	Only 3 of the 4	regimes	Only 2 of the 4 h		Dominated by 1
3. Velocity/Depth Regime	present (slow-dee	p, slow-	present (if fast-	shallow is	regimes present (f fast-	velocity/depth regime.
	shallow, fast-deep Deep > 1.5 feet.), fast-shallow.	missing, score l		shallow or slow s	hallow are	,
SCORE	20 19 13	8 17 16	missing other re		missing, score lov		
		, 17 IU	13 14	3 14 11	10 9 8	7 6	5 4 3 2 1 0

- premeral -				
4. Sediment Deposition SCORE	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposit on of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5. Channel Flow Status	20 19 18 17 16	15 14 13 12 11	1 9 8 7 6	5 4 3 2 1 0
	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fins 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16		10 0 0 7	
7 Frequency of Riffles	Occurrence of riffles relatively frequent; spacing between riffles 5 to 7 stream widths. Variety of habitat is key. In streams where riffles are continuous, boulders or logs are important.	Occurrence of riffles infrequent; distance between riffles divided by stream width is between 7 to 15.	10 9 8 7 6 Occasional riffle or bend: bottom contours provide some habitat; distance between riffles divided by stream width is between 15 to 25.	5 4 3 2 1 0 Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width is > than 25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	, 8 7 6	5 4 3	2 1 0
SCORE	Pick Paul (10)			
(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

LAWRENCE COUNTY KY 32 WETLAND REPORT Item No. 12-284

Wetland A is located on the northeast side of existing KY 32 at STA 20+00. According to the Cowardin classification, Wetland A would be considered a palustrine scrub-shrub wetland that is seasonally flooded (PSS1C). Total wetland area is 0.178 acres; of this area, 0.012 acres will be impacted by the project. Vegetation is dominated by black willow (Salix nigra) and buttonbush (Cephalanthus occidentalis) in the shrub stratum and cattail (Typha latifolia) in the herbaceous stratum. The vegetation is considered hydrophytic since 100 percent of the dominant plants are facultative (FAC), facultative wetland (FACW), and/or obligate (OBL). The soil is composed of Udorthents (UdC). The soil has a matrix color of 10YR 5/1 and mottle color of 10YR 4/6 at a depth of six to ten inches. Soil texture is loam. Low matrix chroma and the presence of common, medium, and prominent mottles are hydric soil indicators. Wetland hydrology is indicated by soil inundation to a depth of one inch and the presence of oxidized root channels. Wetland A drains to tributary of Harriet Branch.

Wetland B is located off Two Mile Creek Road near STA 197+00. The wetland would be considered palustrine emergent wetland that is saturated (PEM1B). Total wetland area is 0.184 acres, and will be avoided. The wetland was supporting hydrophytic vegetation when it was originally delineated in 2003. At the time of the current delineation, vegetation was closely cropped. Dominant vegetation that could be discerned consisted of soft rush (*Juncus effusus*), fescue species (*Festuca* sp.), panic grass species (*Dichanthelium* sp.), and sedge species (*Carex* sp.). Although an indicator status could not be assigned to all dominants, it is likely that greater than fifty percent of the vegetation has an indicator status of FAC or wetter. The soil belongs to the Orrville silt loam, frequently flooded (Or) series, which is listed on the Lawrence County hydric soils list. The soil has a matrix color of 2.5Y 6/1 at a depth of 8 to 10 inches. Common, fine, and prominent mottles of 10YR 5/6 are present. Soil texture is sandy clay. Low matrix chroma, mottling, and an aquic moisture regime are hydric soil indicators. Wetland hydrology is indicated by soil saturation at a depth of 4 inches, as well as the presence of oxidized root channels. Wetland B drains to a tributary of Smoky Valley Fork.

Wetland C is located off KY 32 near STA 72+00 and would be considered palustrine scrub-shrub wetland that is saturated (PSS1B). Total wetland area is 0.362 acres, and the area of impact is 0.077 acres. Dominant species include buttonbush, black willow, and rose species (Rosa sp.) in the shrub stratum and cattail, Joe pye weed (Eupatorium fistulosum), and seedbox (Ludwigia alternifolia) in the herbaceous stratum. The hydrophytic vegetation criterion is met since at least 83 percent of the dominant plants are FAC or wetter. The soil is composed of

Udorthents and has a silt loam texture. The soil is gleyed and has a matrix color of 5/N (Gley 1 page) at a depth of 8 to 10 inches. A spring contributes to wetland hydrology, and an intermittent stream runs through the middle of the wetland. Soil saturated at the surface indicates wetland hydrology.

Wetland D is located in Waste Area 13 and is the fringe of a pond with a Cowardin classification of palustrine emergent wetland that is saturated (PEM1B). The wetland area is 0.011 acres, and will be completely impacted. Vegetation is dominated by herbaceous species such as *Juncus effusus*, two other species of rush (*Juncus* spp.), and cattail. It is likely that 100 percent of the dominant plants are FAC or wetter. The soil is a combination of Udorthents and Blairton-Cruze-Marrowbone Complex. The soil is gleyed with a matrix color of 8/N (Gley 1 page) and a silty clay texture. Mottles of 2.5Y 6/4 are common, coarse, and prominent. Wetland hydrology is indicated by soil saturation at the surface and 1 to 6 inches of inundation at the wetland's edge. Wetland D drains to an ephemeral stream, then falls down the face of a highwall, becoming overland flow through a fill site, and eventually reaching a roadside ditch.

Wetland E is located in Waste Area 11 and is the fringe of a pond with a Cowardin classification of palustrine emergent wetland that is seasonally flooded (PEM1C). Total wetland area is 0.024 acres, and will be completely impacted. The dominant species are shrub-size black willow and herbaceous vegetation such as *Juncus effusus* and seedbox. The vegetation is considered hydrophytic since 100 percent of the dominant plants are FACW+. The soil belongs to the Shelocta-Hazelton-Fedscreek Complex. The soil has a matrix color of 10YR 5/2 at a depth of 8 inches. Many, coarse, prominent mottles of 10YR 5/6 are present. Soil texture is sandy clay. Low matrix chroma and mottling are hydric soil indicators. Wetland hydrology is indicated by soil saturation at the surface, inundation to a depth of 6 inches at the wetland's edge, and the presence of oxidized root channels. Wetland E drains to Wetland F.

Wetland F is located in Waste Area 11 and is a palustrine emergent wetland that is seasonally flooded (PEM1C) that drains to a pond with wetland fringe of the same classification. The wetland area is 0.226 acres, and will be totally impacted. Dominant vegetation is composed of red maple (*Acer rubrum*) in the tree stratum, buttonbush in the shrub stratum, and *Juncus effusus*, woolgrass (*Scirpus cyperinus*), and *Carex* species in the herbaceous stratum. The vegetation is considered hydrophytic since 100 percent of the dominant plants are FAC or wetter. The soil belongs to the Shelocta-Hazelton-Fedscreek complex. The soil has a matrix color of 10YR 5/1 and a sandy clay texture at a depth of 8 to 10 inches. Mottles of 10YR 4/6 are common, medium, and prominent. Wetland hydrology is indicated by soil saturation at the surface and areas of inundation to a depth of 1 inch. Wetland F drains to an ephemeral stream.

(1987 COE Wetlands Delineation Manual)

Project/Site: Wetland A Applicant/Owner: KY 32 Investigator: J. Clark / R. Lewis	Date: 02/24/2009 County: Lawrence State: KY		
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	✓ Yes	No	Community ID :
	Yes	No ✓	Transect ID:
	Yes	No ✓	Plot ID:

VEGETATION

Dominant Plant Species	<u>Stratum</u>	Indicator	Dominant Plant Species	<u>Stratum</u>	<u>Indicator</u>
1. Salix nigra	<u>s</u>	FACW+	9	aless de la completa del la completa de la completa del la completa de la completa del la completa de la comple	pr in his desire fundament desired.
2. Cephalanthus occidentalis	S	OBL	10		
3. Typha latifolia	<u>H</u>	OBL	11	was sign time, humanité chandre est	anadada et serve adde del ade
4			12		Management Andre Asperties on
5	· I are again that are assumed to		13		
6	manufacture and the Control of the Control	ness with children and children	14		
7			15		
8			16		secondary research
Percent of Dominant Species that (excluding FAC-).	t are OBL, F	FACW or FAC	100%		
Remarks:					

Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: Inundated Saturated in Upper 12 Inches Water Marks Drift Lines
Field Observations:	Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required):
Depth of Surface Water: 1 (in.)	Oxidized Root Channels in Upper 12" Water-Stained Leaves
Depth to Free Water in Pit:(in.)	Local Soil Survey Data
Depth to Saturated Soil: 0 (in.)	FAC-Neutral Test Other (Explain in Remarks)
Remarks:	

SOILS

Wetland A

	i Phase): <u>Udo</u>	orthents (UdC)	Field (Drainage Class: - Field Observations Confirm Mapped Type? Yes No				
Profile Des Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.			
6-10	B	10YR 5/1	1 <u>0YR 4/6</u>	com/med/prom	loam			
					Above to an advantage of the second s			
Hydric Soi	I Indicators:							
	Histosol Histic Epipedon Sulfidic Odor Aquic Moisture Regime Reducing Conditions Gleyed or Low-Chroma Colors — Concretions High Organic Content in Surfa ce Layer Sandy Soils Organic Streaking in Sandy Soils Listed on Local Hydric Soils List Listed on National Hydric Soils List Other (Explain in Remarks)							
Remarks:								

	res No res No res No	(Circle)	(Circle) Is this Sampling Point Within a Wetland? Yes No
Remarks: PSS1C			

(1987 COE Wetlands Delineation Manual)

Project/Site: Wetland B Applicant/Owner: KY 32 Investigator: J, Clark / R. Lewis	Date: 02/25/2009 County: Lawrence State: KY		
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	No ✓	Community ID :
	✓ Yes	No	Transect ID:
	Yes	No ✓	Plot ID:

VEGETATION

Dominant Plant Species	Stratum Indicator	Dominant Plant Species	Stratum Indicator
1. Juncus effusus	H FACW+	9	and control of the second
2. Festuca sp.	H NI	10	
3 Dichanthelium sp.	H NI	11	Again do Againgtife and Against Agains
4. Carex sp.	H NI	12.	and the second s
5	to and the state of the state o	13	
6	age can be have a recommendation of the contract of the contra	14	
7		15	And desired the second
8		16	
Percent of Dominant Species the (excluding FAC-).	at are OBL, FACW or F	FAC <u>likelv ≥50%</u>	
Remarks:			I

Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: Inundated ✓ Saturated in Upper 12 Inches Water Marks Uprit Lines
Field Observations: Depth of Surface Water:(in.) Depth to Free Water in Pit:(in.) Depth to Saturated Soil:(in.)	Sediment Deposits Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required): Oxidized Root Channels in Upper 12" Water-Stained Leaves Local Soil Survey Data FAC-Neutral Test Other (Explain in Remarks)
Remarks:	

SOILS

Wetland B

	Phase): Orn	ville silt loam, freq luventic Endoaqu	F	Orainage Class: <u>SPD</u> Tield Observations Confirm Mapped Type? Yes No				
Profile Des Depth (inches) 8-10	Horizon B	Matrix Color (Munsell Moist) 2.5Y 6/1	Mottle Colors (Munsell_Moist) 10YR 5/6	Mottle Abundance/Cont	Texture, Concretions, rast Structure, etc. sandy clay			
and the second s								
 	Hydric Soil Indicators: Histosol							
Remarks:								

	∕Yes ∕Yes ∕Yes	No No No	(Circle)	Is this Sampling Point Within a Wetland?	(Circle) Ves No
Remarks: PEM1B. Wetland vegetation original delineation in 2003.	has be	en clo	sely crop	ped, but wetland vegetation was presen	t for the

(1987 COE Wetlands Delineation Manual)

Project/Site: Wetland C	Date: <u>02/25/2009</u>	
Applicant/Owner: KY 32	County: <u>Lawrence</u>	
Investigator: J. Clark / R. Lewis	State: <u>KY</u>	
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	✓ Yes No Yes No ✓ Yes No ✓	Community ID : Transect ID: Plot ID:

VEGETATION

Dominant Plant Species	<u>Stratum</u>	<u>Indicator</u>	Dominant Plant Species	<u>Stratum</u>	Indicator
1. Typha latifolia	<u>H</u>	OBL	9.	pur south of the risk of constitute	yanalasi -shekku-appayamba
2. Cephalanthus occidentalis	<u>S</u>	OBL	10		ganggangan (panaryonganis ad ta
3. Rosa sp.	<u>s</u>	NI	11	where the same subjects to the same	наумера убългония мете ле
4 Eupatorium fistulosum	<u>H</u>	FACW	12.		de amount experiments after the 1941
5. Salix nigra	S	FACW+	13	AND THE PERSON NAMED IN	antan e e e e e e e e e e e e e e e e e e e
6. Ludwigia alternifolia	<u>H</u>	FACW+	14		ga garangaga kalananda kalanan
7			15,		ppingapodini smranimi
8			16,		gravit en skip effek elser het skip
Percent of Dominant Species that (excluding FAC-).	are OBL,	FACW or FAC	at least 83%		
Remarks:					

Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: Inundated ✓ Saturated in Upper 12 Inches Water Marks Drift Lines
Field Observations: Depth of Surface Water: 1" in stream (in.) Depth to Free Water in Pit: (in.) Depth to Saturated Soil: 0 (in.)	Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required): Oxidized Root Channels in Upper 12" Water-Stained Leaves Local Soil Survey Data FAC-Neutral Test Other (Explain in Remarks)
Remarks:	

SOILS

Wetland C

Map Unit Name (Series and Phase): _Udorthents (UdC) Taxonomy (Subgroup): Udorthents				Field Observations			
Profile Des Depth (inches) 8-10	HorizonB	Matrix Color (Munsell Moist) Gley 1.5/N	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc. silt loam		
	Hydric Soil Indicators: — Histosol — Concretions — High Organic Content in Surfa ce Layer Sandy Soils — Sulfidic Odor — Organic Streaking in Sandy Soils — Aquic Moisture Regime — Listed on Local Hydric Soils List — Reducing Conditions — Listed on National Hydric Soils List ✓ Gleyed or Low-Chroma Colors — Other (Explain in Remarks)						

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	✓Yes ✓Yes ✓Yes	No No No	(Circle)	Is this Sampling Point Within a Wetland?	(Circ Yes	ile) No
Remarks: PSS1B						

(1987 COE Wetlands Delineation Manual)

Project/Site: Wetland D Applicant/Owner: KY 32 Investigator: J. Clark / R. Lewis			Date: 02/24/2009 County: Lawrence State: KY
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	✓ Yes	No	Community ID :
	Yes	No ✓	Transect ID:
	Yes	No ✓	Plot ID:

VEGETATION

Dominant Plant Species	Stratum Indicator	Dominant Plant Species	Stratum Indicator
1. Juncus effusus	H FACW+	9.	winds on the state of the second seco
2. Juncus sp. 1	H NI	10	
3. Typha latifolia	H OBL	11	And the contract of the contra
4. Juncus sp. 2	H NI	12.	
5	A. No his graph come approximate and approxima	13	
6	and control of the co	14	
7		15.	- And Application of the Control of
8		16	
Percent of Dominant Species that (excluding FAC-).	at are OBL, FACW or FAC	likely 100%	
Remarks:			

1	Sodiment Denosite
Field Observations:	Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required):
Depth of Surface Water: 2-6 (in.)	✓ Oxidized Root Channels in Upper 12" Water-Stained Leaves
Depth to Free Water in Pit:(in.)	Local Soil Survey Data FAC-Neutral Test
Depth to Saturated Soil: 0 (in.)	Other (Explain in Remarks)

	Phase): see	remarks quic Hapludalfs	Field	age Class: <u>SPD</u> Observations onfirm Mapped Type? Yes N	> 0	
Profile Des Depth (inches) 8	Horizon B	Matrix Color (Munsell Moist) Gley 1 8/N	Mottle Colors (Munsell Moist) 2.5Y 6/4	Mottle Abundance/Contrast com/coarse/prom	Texture, Concretions, Structure, etc. silty clay	
Hydric Soil Indicators: — Histosol — Concretions — Histic Epipedon — High Organic Content in Surfa ce Layer Sandy Soils — Sulfidic Odor — Organic Streaking in Sandy Soils — Aquic Moisture Regime — Listed on Local Hydric Soils List — Reducing Conditions — Listed on National Hydric Soils List — Gleyed or Low-Chroma Colors — Other (Explain in Remarks)						
Remarks: Udorthe	nts (UdC) an	nd Blairton-Cruze	-Marrowbone (Bl	ID)		

	′Yes N ∕Yes N ∕Yes N	0	(Circle) Is this Sampling Point Within a Wetland? Yes No
Remarks: PEM1B around fringe of pond	j		

(1987 COE Wetlands Delineation Manual)

Project/Site: Wetland E Applicant/Owner: KY 32 Investigator: J. Clark / R. Lewis			Date: <u>02/25/2009</u> County: <u>Lawrence</u> State: <u>KY</u>
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	✓ Yes	No	Community ID :
	Yes	No ✓	Transect ID:
	Yes	No ✓	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1, Juncus effusus	<u>H</u>	FACW+	9.	manner of facility for with a con-	graphs represented the
2. Ludwigia alternifolia	H	FACW+	10		
3 Salix nigra	<u>s</u>	FACW+	11	mps of transmission Summerous	
4	and the control of th		12		
5	S in all latter to stratify and deposits in instrument		13		-
6	man and count Make 12 of 3 year Me	on standal manages report times	14	ate at the case of company to the company of the case	-
7		and the second s	15		ggennegleinsteller og state og state og state
8			16		agenty or the annual feeting.
Percent of Dominant Species that (excluding FAC-).	t are OBL,	FACW or FAC	_100%		
Remarks:					

Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: Inundated Saturated in Upper 12 Inches Water Marks Drift Lines
Field Observations:	Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required):
Depth of Surface Water:	Oxidized Root Channels in Upper 12" Water-Stained Leaves
Depth to Free Water in Pit:(in.)	Local Soil Survey Data FAC-Neutral Test
Depth to Saturated Soil: 0 (in.)	Other (Explain in Remarks)
Remarks:	

Map Unit Name (Series and Phase): Shelocta-Hazelton-Fedscreek (ShF) Taxonomy (Subgroup): Typic Hapludalfs & Dystrudepts Drainage Class: WD Field Observations Confirm Mapped Type? Yes No								
Profile Des Depth (inches)	scription: Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.			
8	В	10YR 5/2	1 <u>0YR 5/6</u>	many/coarse/prom	sandy clay			
	and the second of the second o	gen regarde austren, von verschild bletten inn inn der						
waters was up none, o								
	Application of the state of the							
Hydric Soi	Indicators:							
	_ Histosol _ Histic Epiped _ Sulfidic Odo	r		Organic Streaking in Sa	n Surfa ce Layer Sandy Soils andy Soils	5		
	Aquic Moisture Regime Reducing Conditions Gleyed or Low-Chroma Colors Listed on Local Hydric Soils List Listed on National Hydric Soils List Other (Explain in Remarks)							
Remarks:								

Hydrophytic Vegetation Present? ✓Yes Wetland Hydrology Present? ✓Yes Hydric Soils Present? ✓Yes	No No No	(Circle)	Is this Sampling Point Within a Wetland?	(Circle) Yes No)
Remarks: PEM1C around fringe of pond					

(1987 COE Wetlands Delineation Manual)

Project/Site: Wetland F Applicant/Owner: KY 32 Investigator: J. Clark / R. Lewis	Date: <u>02/25/2009</u> County: <u>Lawrence</u> State: <u>KY</u>		
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	✓ Yes	No	Community ID :
	Yes	No ✓	Transect ID:
	Yes	No ✓	Plot ID:

VEGETATION

Stratum	Indicator	Dominant Plant Species	Stratum	<u>Indicator</u>			
<u>H</u>	FACW+	9.	to the interview on constitute	anst tal naznatnij nogo od odo			
T	FAC	10		communication of the separate power			
<u>H</u>	FACW+	11,	arcount the rail declare of the	Control and a finished and a substant annument			
<u>H</u>	NI	12.		Management of the last of the			
S	OBL	13		Walter Communication Communica			
Make a strong record to sight of a	AN ANALAS PRINCIPLE AND ANALAS AN	14	Contract the second contract of the				
		15		and the second second second second			
		16		upo, suo affidenta hardin MA			
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)							
	Т Н В	T FAC H FACW+ H NI S OBL	T FAC 10	T FAC 10			

Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: Inundated Saturated in Upper 12 Inches Water Marks Drift Lines		
Field Observations: Depth of Surface Water: _1(in.)	Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required): Oxidized Root Channels in Upper 12"		
Depth to Free Water in Pit:(in.) Depth to Saturated Soil:(in.)	Water-Stained Leaves Local Soil Survey Data FAC-Neutral Test Other (Explain in Remarks)		

Map Unit Name (Series and Phase): Shelocta-Hazelton-Fedscreek (ShF) Taxonomy (Subgroup): Typic Hapludalfs & Dystrudepts Taxonomy (Subgroup): Typic Hapludalfs & Dystrudepts Taxonomy (Subgroup): Typic Hapludalfs & Dystrudepts								
Profile Des Depth (inches)	cription: Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell_Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.			
8-10	B	10YR 5/1	1 <u>0YR 4/6</u>	com/med/prom	sandy clay			
	seems defermed in Company (187) with		consecutives the residency of the set of the					
William Control of the Control	And the second s	and the second s		man Aldra Mills (1974, 1974), in hai shiften blacked y relationers considerate reliabilities				
america arcoro. arcoro.		The state of the s	a van amerika	gapping digraphs for the field of the pool of the gapping and the second				
	\$155 place for over free designations records retain							
Hydric Soil Indicators: Histosol								
Remarks:								

	✓Yes N ✓Yes N ✓Yes N	0	(Circle)	Is this Sampling Point Within a Wetland?	(Circ	cle) No
Remarks: PEM1C						